ABSTRACT

Novel heterodiamondoids are disclosed. These heterodiamondoids are diamondoids that include heteroatoms in the diamond lattice structure. The heteroatoms may be either electron donating, such that an *n*-type heterodiamondoid is created, or electron withdrawing, such that a *p*-type heterodiamondoid is made. Bulk materials may be fabricated from these heterodiamondoids, and the techniques involved include chemical vapor deposition, polymerization, and crystal aggregation. Junctions may be made from the *p*-type and *n*-type heterodiamondoid based materials, and microelectronic devices may be made that utilize these junctions. The devices include diodes, bipolar junction transistors, and field effect transistors.